IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

AMPEX CORPORATION, *Plaintiff,* v. EASTMAN KODAK COMPANY, ALTEK CORPORATION, and CHINON INDUSTRIES, INC., *Defendants.*	)	C.A. No. 04-1373 (KAJ) **REDACTED** **CORRECTED VERSION**

CORRECTED VERSION
DECLARATION OF CHARLES G. BONCELET, JR.

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FOR THE DISTRICT OF DELAWARE

AMPEX CORPORATION, *Plaintiff,* v. EASTMAN KODAK COMPANY, ALTEK CORPORATION, and CHINON INDUSTRIES, INC., *Defendants.*	C.A. No. 04-1373-KAJ **PUBLIC VERSION**

DECLARATION OF CHARLES G. BONCELET, JR.

I, Charles G. Boncelet, declare as follows:

1. I understand that this Declaration is being submitted in support of Plaintiff Ampex Corporation's Brief in Opposition to Defendants' Motion for Summary Judgment of Noninfringement. Unless specifically indicated otherwise, this Declaration is made based on personal knowledge.

2. As set forth in my resume (attached hereto at Exhibit 1), I am currently a professor in the Departments of Electrical & Computer Engineering (ECE) and Computer & Information Sciences (CIS) at the University of Delaware. My primary research interests are in the fields of image and signal processing, computer networking, data compression, multimedia, and digital watermarking, and steganography.

3. I earned my Bachelor's degree in Applied and Engineering Physics from the Cornell University in 1980.

4. I earned my Master's degree in Electrical Engineering and Computer Science from Princeton University in 1981.

5. I earned my Doctorate in Electrical Engineering and Computer Science from Princeton University, 1984.

6. I began work as a professor in the ECE and CIS Departments at the University of Delaware in 1984. As a professor in the ECE and CIS departments, I have more than 20 years of experience in the fields of image and signal processing.

7. Over the past twenty years, I have taught courses in multimedia, signals and systems, digital and analog circuit theory, digital signal processing, and information theory. I have also supervised more than 25 graduate students in fields related to image and signal processing.

8. I have also published or presented over ninety articles related to image and signal processing. A complete listing of my publications is attached hereto at Exhibit 1.

9. I have also served as the Chair of various conferences related to image and signal processing, and have served as a reviewer for various journals and textbooks in those fields (including the IEEE Transactions on Signal Processing, Information Theory, Image Processing, Automatic Control, and Signal Processing Letters.) I am also a member of the Institute of Electrical and Electronics Engineers (IEEE), the Society for Industrial and Applied Mathematics (SIAM), The Association for Computing Machinery (ACM), the American Society of Engineering Education (ASEE), the Delaware Academy of Science, Eta Kappa Nu, and Tau Beta Pi.

10. I have also been awarded two patents in the field of signal processing.

11. In connection with the formation of my opinions in this case, I have reviewed U.S. Patent No. 4,821,121 ("the '121 patent"), its prosecution history, and the cited prior art. I have also reviewed selected portions of printouts of source code for Kodak's V550, DX7630, CX7330, DX4900, CX7300, and C330 digital cameras. I have been asked to assume that those cameras are representative of the remaining Kodak digital cameras for purposes of this report. I have also reviewed image processing specifications relating to the operation of the Kodak digital cameras, as well as additional pertinent documents relating to the architecture and operation of the above mentioned cameras. I have also reviewed attachments to the Expert Reports of Kendall Dinwiddie and Stephen Gray, which I understand have been submitted as attachments to the Initial Disclosure of Expert Testimony of Dr. George T. Ligler, filed on March 24, 2006. I have also reviewed various industry standards relating to digital cameras and the image processing algorithms used therein, including versions 2.1, 2.2, and 2.21 of the Exif standard, versions 1.0 and 2.0 of the DCF standard, the ITU-R BT.601 standard, the ITU-R BT.709 standard, and the ITU-T.IS 10918-1 standard. I have also reviewed documents relating to the state of the art in the fields to which the '121 patent pertains at the time of the filing of the '121 patent application, including documents referred to in this report. I have also reviewed the deposition testimony of various Kodak and Altek witnesses from this litigation, as well as what I understand to be a previous ITC investigation instituted by Ampex against Kodak.

12. Based on my review of the '121 patent and its file history, I understand that the '121 patent application was filed on April 8, 1983. I further understand the '121 patent is attached as Exhibit 1 to the Declaration of Ray R. Zado in

Support Ampex Corporation's Opposition to Defendants Motion for Summary Judgment of Non-Infringement.

I. IMAGE PROCESSING IN THE CONTEXT OF THE '121 PATENT DISCLOSURE

13. As described with respect to the preferred embodiment of the '121 patent, video images are captured by the disclosed video still store system from a video input circuit, such as "another still store system, a TV camera, or some other source of video data." ('121 patent 2:65-3:1)

14. The video input circuit includes both "appropriate video signal decoding means to process video data received from sources that provide the data in an encoded form," as well as the circuitry necessary to provide a video signal or video data to the described still store system.

15. The analog video signal provided by the video input circuit is transferred to an Analog to Digital converter, which converts the data for the video image into "a digital form that is suitable for handling and processing by digital circuitry." ('121 patent, 3:12-19)

16. Thus, the '121 patent discloses that data representing digital images should be encoded in a format appropriate to the intended use of the data.

17. In the preferred embodiment, this digital data represents the image in terms of "pixels," each of which is "represented by three eight bit data bytes defining respectively luminance, red chrominance, and blue chrominance components." ('121 patent, 3:20-24)

18. A "pixel" is a picture element that is used to represent the video image. Commonly, each pixel is described, in the most basic sense, in terms of a color and an intensity value.

19. The particular color of a given pixel can be characterized using various formats. The format used for representing the color of digital pixel data in terms of measurable values is often referred to by those of skill in the art as a "color space."

20. As one of ordinary skill in the art at the time of the '121 patent application would have understood, different color spaces could be used interchangeably to represent the color values of images comprised of digital pixel data. From the time of the '121 patent application to the present, a number of additional color space representations have been introduced and come into common usage.

21. One common form of color space used for representing digital pixel data at the time of the '121 patent application is the RGB color space.

22. In the RGB (i.e. "Red," "Green," "Blue") color space, the color of each of the pixels comprising a digital video image is represented by three values, one of which sets forth the amount of red for the color of the pixel, the second the amount of green, and the third the amount of blue. Each of these individual values is referred to as a "color component."

23. These color component values, when combined in the appropriate manner, provide the color for the pixel. The complete range of colors that can be accurately represented by a given color space based on the combination of the various color components is referred to as the "gamut" of that color space.

24. Some of the earliest forms of defined RGB color spaces were developed in connection with standards for color television. Two of these early forms of RGB color spaces are known as the NTSC RGB and the PAL/SECAM RGB color spaces.

25. Another well known color space used for representing digital images at the time of the '121 patent application is the YCbCr (also known as YCC) color space. In the YCbCr color space, the color of a given pixel is determined by a luminance component, a red chrominance difference component, and a blue chrominance difference component. This color space was originally created in response to the need to

come up with a method of broadcasting color television video signals in a way that is compatible with the older black and white television standards. The luminance component could be used by the preexisting black and white televisions to display a black and white picture. The "color difference" components were used to create the color picture for color televisions.

26. There are a number of different versions of the RGB and YCbCr color spaces that are commonly used in the field of digital image processing.

27. For example, one RGB color space formulated in the mid 1990's that is used for representing digital images is the sRGB, or "standard RGB" color space. (*See* Stokes & Anderson et al, "A Standard Default Color Space for the Internet – sRGB," printed from http://www.w3.org/Graphics/Color/sRGB) (Exhibit 2)

28. The sRGB color space, as well as its predecessors, the NTSC and PAL/SECAM RGB color spaces, were especially designed based upon the characteristics of cathode ray tube (CRT) displays, such as CRT televisions or monitors. (*Id.* at p. 2)

29. When images are displayed on display devices, such as a CRT, a given color value input to the display device is not necessarily the exact color value that is output by the display device. This is due to the inherent emission characteristics of the particular display device. The relationship between the input and output values of a display device is commonly described in term of a numerical value or curve. This value is referred to as the display device's "gamma," or "gamma curve."

30. The sRGB color space defines a non-linear transformation between the values of the R, G, and B color components that in an idealized system would provide the desired color value, and the actual numerical values for those components that are stored and used to represent the desired color value. This non-linear transformation is similar to the gamma response of a CRT display.

31. The sRGB color space, because it was designed based on the emission characteristics of CRT displays, provides for a reasonably efficient use of bit values to represent each color component, in order to display human-discernable colors

on CRT displays. Put another way, the sRGB color space is an efficient method of encoding color values to be displayed on a CRT, while still providing a sufficiently wide color gamut (from the perspective of human visual perception) once the images are displayed. These basic colorimatery techniques have been known in the art since the development of color television.

32. Similarly, one form of YCbCr that was defined in 1982 for standard-definition television use is set forth by the ITU-R BT.601 (formerly CCIR 601) standard. Like sRGB, this form of YCbCr was designed based upon the gamma response of CRT displays. This is the particular form of YCbCr encoding referred to in the '121 patent (*See* '121 patent 3:19-29)

33. Since the time of the '121 patent application, versions of the RGB and YCbCr color spaces have been developed that were more particularly suited to newer forms of display devices, such as HDTVs, and LCD displays.

34. For example, one form of the YCbCr color developed in 1990 for use in High Definition Television (HDTV) and computer-display oriented applications is specified in the ITU-R BT.709 standard. This form of YCbCr is based on a model that more closely fits the gamma characteristics of newer CRTs, LCD displays, and other modern display devices.

35. Another form of RGB developed in the late 1990s for storing, interchanging, and manipulating digital images is the Reference Output Medium Metric RGB, or ROMM RGB color space. This color space was specifically designed to be device independent. (*See* "Reference Output Medium Metric Color Space (ROMM RGB) White Paper," printed from http://www.scarse.org/docs/kodak/ProPhoto.pdf) (Exhibit 3)

36. Other common color spaces used for digital image processing include Apple RGB, Adobe RGB 98, e-sRGB, NIF RGB, RIMM RGB, and Photo YCC.

37. As one of ordinary skill in the art would understand, conversion from one color space to another is commonly used when dealing with digital images.

These conversions provide for more a suitable representation of the data for, e.g., a given image processing step, or display on a given type of display device.

38. As one ordinary skill in the art would also understand, performing a conversion between differing representations of data for a digital image (i.e. between one color space and another) does not mean that the image is no longer the same image, or that the digital data representing the image is no longer the same data.

39. Rather, color spaces are simply mathematical tools for representing data in different formats that are appropriate to a given use of the data, much like the use of polar or Cartesian coordinates are used in geometry.

40. In geometry, a point on a plane can be represented using Cartesian coordinates, which define the distance of the point from each of a pair of axes, (i.e. the x and y axes). Alternatively, the same point can be described using polar coordinates, which define the distance of a point on a plane from a given base point (called a pole), as well as an angular distance from a polar axis. Although the numerical values in Cartesian and polar coordinates may be different, the same point at the same position is being described in either instance. In the same way, different color spaces can be used to represent the same data for a digital image.

41. Another example of representing the same data in different formats illustrated by the representation of stereo audio for FM broadcast. (*See, e.g.*, Murray Crosby, "A Compatible System of Stereo Transmission by FM Multiplex," Journal of the Audio Engineering Society, Vol. 6, No.2 (Apr. 1958)). (Exhibit 4)

42. Stereo audio consists of two channels, left (L) and right (R). In FM Multiplex transmissions, the two channels are encoded as an average (L+R)/2 and a difference (L-R)/2. The average is transmitted in such a way that traditional monaural receivers can decode it. The difference is transmitted in a way that is invisible to the traditional receiver (just as the chrominance signals are invisible to a black and white television set). A stereo receiver can receive both signals, add them to obtain the L channel, and difference them to obtain the R channel. The average signal is analogous to

the video luminance signal and the difference signal is analogous to the video chrominance signals.

43. The '121 patent describes various processing steps performed on the digital data representing images captured by the system in addition to color space encoding.

44. For example, the '121 patent expressly discloses the use of compression for digital data representing video images encoded in YCbCr format. Data compression techniques were well known at the time of the '121 patent application. Such compression techniques could be "lossless," meaning that there was no loss of data in the compression/decompression process, or it could be "lossy," meaning that some data was lost in the compression/decompression process. The type of compression disclosed in the '121 patent was lossy compression.

45. The particular form of lossy image compression described in the '121 patent is subsampling of chrominance data:

> The input AD 14 receives the video signal from the video input 12 and converts the video signal to the digital sampled data form in which each pixel of video data is represented by three eight bit data bytes defining respectively luminance, red chrominance and blue chrominance components. *Conventionally, the chrominance data has half the spatial resolution of the luminance data in the horizontal dimension.* ... The single byte representation affords a high dynamic resolution of 256 distinguishable states for each color component. For adequate dynamic resolution, each video component at a sampled data point is preferably defined by at least 6 binary bits providing 64 distinguishable intensities.

('121 patent 3: 16-34) (emphasis added).

46. Thus, as described in the '121 patent, chrominance data is only captured for every other pixel. This lossy compression takes advantage of the fact that the human eye is less sensitive to color than it is to luminance, and so even though color is measured at half the sampling rate as luminance, the human eye does not detect the difference.

47. Moreover, as one of ordinary skill in the art would have known, NTSC television broadcast equipment, including the types of equipment that would have been employed as a video input circuit, typically compressed chrominance signals by eliminating high frequency components to which the human visual system is insensitive.

48. Thus, one of ordinary skill in the art, in reviewing the '121 patent disclosure, would have understood that such lossy compression would commonly have been performed in the video input circuit of the disclosed still store system.

49. The above quoted portion of the '121 patent also describes the use of varying bit resolutions for each of the color components for a given pixel. The reference to "high dynamic resolution of 256 distinguishable states for each color component" is to a sampling precision of eight bits per digital data sample, and the reference to "adequate dynamic resolution, each video component at a sampled data point is preferably defined by at least 6 binary bits providing 64 distinguishable intensities" is to a sampling precision of six bits per digital data sample. ('121 patent 3: 16-34) Thus, the '121 patent expressly teaches that the bit resolution should be selected according to the desired dynamic resolution for the intended use of the data. *I.e.*, the patent teaches that data can be discarded in order to save on memory storage requirements, at the cost of reduced image resolution, or *vice versa*. Again, this is a form of lossy compression. Indeed, one of ordinary skill in the art would have recognized that the very process of converting an analog video signal to a digital format (as performed in the preferred embodiment '121 patent) is lossy.

50. One of ordinary skill in the art, in reviewing the '121 patent disclosure, would have understood that this lossy compression would commonly have been performed in the video input circuit of the disclosed still store system.

51. In addition to the various encoding and processing steps expressly disclosed in the '121 patent, one of ordinary skill in the art at the time of the '121 patent application would have recognized that other forms of processing would be used in connection with the generation and storage of digital pixel data used to represent images.

52. For example, as of the time of the '121 patent application, one of ordinary skill in the art would have understood that video input circuits used in connection with still store systems, such as TV cameras, would include various forms of processing to provide for enhanced representations of images.

53. One example of the type of processing performed by video input circuits (such as broadcast TV cameras) was gamma correction. As described above, gamma correction is performed in order to take into account the emission characteristics of display devices, such as CRT televisions or monitors.

54. The NTSC broadcast television standard (CCIR 470; currently ITU-R BT.470) (Exhibit 5), in force at the time of the '121 patent application specified that broadcast television sources (e.g. broadcast TV cameras) should perform gamma correction on output video signals, and further specified the appropriate gamma correction factor to use. Thus, one of ordinary skill in the art, upon reading the '121 patent disclosure, would have known that the signals provided by the video input circuits would have been gamma corrected.

55. One of ordinary skill in the art, in reviewing the '121 patent disclosure, would have understood that the processing used for gamma correction would commonly have been performed in the video input circuit of the disclosed still store system.

56. Another example of image processing included in broadcast television cameras to provide for enhanced representations of images at the time of the '121 patent application is automatic white balancing.

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58. White balancing is a type of image processing used to ensure that, for images captured by a system (such as a still store or digital camera) the color white actually appears white, and shades of gray do not contain any additional colors. Such processing is necessary on account of how the human eye perceives color.

59. More particularly, most light sources are not absolutely pure white, but have a certain shading to them. This is referred to as the "color temperature" of the light source.

60. For instance, early morning or late afternoon sunlight will appear to be yellow, whereas midday sunlight will be much closer to white.

61. Normally, the human visual system compensates for lighting conditions with different color temperatures, so that white always appears white. However, the image sensors used in cameras, such as broadcast TV cameras used in 1983 (or the digital cameras of today), do not automatically adjust to the color temperature of given light sources.

62. As a result, systems that are used to capture data representing digital images need to find a reference point that represents white. Based on this reference point, the systems can then calculate all other colors for a captured image.

63. One of ordinary skill in the art, in reviewing the '121 patent disclosure, would have understood that the processing used to account for white balancing would commonly have been performed in the video input circuit of the disclosed still store system.

64. Another example of the type of processing included in broadcast television cameras in the 1982-83 timeframe for enhancement of image representation is edge enhancement.

65. At a general level, edge enhancement is a process that increases high spatial frequency information to provide for an apparent sharpening in the edges of images.

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67. One of ordinary skill in the art, in reviewing the '121 patent disclosure, would have understood that the processing used for edge enhancement would commonly have been performed in the video input circuit of the disclosed still store system.

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69. Thus, one of ordinary skill in the art, in reviewing the '121 patent disclosure, would have understood that a number of other image processing techniques to improve the quality of the image would commonly have been performed in the video input circuit of the disclosed still store system.

70. As disclosed in the '121 patent, after the analog signal representing a video image has been converted into the appropriate digital format for handling and processing, this digital pixel data representing the image is stored in a framestore, which in the preferred embodiment is comprised of random access memory. ('121 patent 3:47-49, 66-68).

71. After generation of data representing a reduced resolution copy of the video image, the video data representing the image is "transferred from frame store ... to disk store ... for more permanent storage." ('121 patent, 4:16-19). In the preferred embodiment, the disk store is a "general purpose magnetic disk storage system as [was] currently used with general purpose digital computing systems." ('121 patent 2:29-31; 4:23-27)

72. As one of ordinary skill in the art would understand in reviewing the '121 patent, during this process of transferring the data for the video image, the data actually recorded on the magnetic disk storage system would not be mathematically identical to the data for the video image as stored in the framestore, because data as stored on a magnetic hard disk would be encoded using formats appropriate for more permanent storage of large amounts of data, and to reduce data errors occurring during the recording process.

73. In connection with the formation of my opinions, I have reviewed documents that describe the details of formats used for encoding data stored on magnetic disk drives as used in the 1983 time frame, as well as the expert report and direct testimony of George Ligler from the ITC investigation between Ampex and Kodak.

74. For example, AX210465-67 (Exhibit 9), AX204954-73 (Exhibit 10), and AXD024619-39 (Exhibit 11) are a set of articles that describe forms of encoding used on magnetic hard disks in the 1983 timeframe.

75. As of 1983, one of the prevalent forms of encoding data storage on magnetic disk drives was run length limited, or RLL encoding. RLL encoding was designed to format data in such a way as to provide for a reduction in decoder errors, particularly errors that would result from long string of one's or zero's. In so doing, RLL encoding would significantly change the actual bits recorded on the magnetic disk drive from their original form.

76. Thus, as one of ordinary skill in the art would have understood when reading the disclosure of the '121 patent, the exact numerical representations of data representing a digital image as recorded on the magnetic disc storage would have been completely different from the numerical representation of the data as stored in a frame store, at least on account of the encoding used to store the data on a magnetic storage device.

77. One of ordinary skill in the art would further have recognized that, in spite of the differences in numerical representation and encoding method, the '121

patent still referred to the data representing the image as stored in the framestore, and the data representing the image as stored in the magnetic disc storage, as the same data for the image; and further would have recognized that the '121 patent characterized the image as stored in the framestore and as stored in the magnetic disc storage as the same image.

II. METHODS OF GENERATING PIXEL DATA FROM VISUAL SCENES

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79. CCD-based systems that capture digital images, such as digital cameras, primarily use one of two methods to obtain color information for a visual scene. These methods were known as of the time of the '121 patent application.

80. In the first method, three image sensors (e.g., such as charge coupled device ("CCD") image sensors) are used, each one of which acquires a particular color component for the image to be captured. The signals provided by these image sensors yield the color information for the visual scene.

81. In the second, less expensive but lower resolution method, a single image sensor is used. However, in order to provide sufficient color resolution, the single image sensor is covered with a mosaic of colored filters, such that incident light from the camera lens to the sensor passes through the filters. This mosaic of filters is referred to as a Color Filter Array (CFA).

82. These two approaches were analogous to similar approaches previously used for color camera tubes. *See* U.S. Patent 4,166,280 (Exhibit 13).

83. The most commonly used CFA, the Bayer-matrix, consists of red, green, and blue color filter elements. They are arranged so that each individual element of

the image sensor element collects only one colored light. *See* U.S. Patent 3,971,065 (Exhibit 14).

84. When a system such as a digital camera is used to capture an image, the image sensor generates analog signals representing the pixel values for a captured image.

85. The analog signals are then supplied to an analog to digital converter, which is used to generate digital pixel data for a digital image.

86. This digital data representing the image is encoded in a subsampled version of the RGB color space. In other words, each pixel has a value for one of the three color components. This subsampled RGB format is also referred to as "CFA format."

87. In order to generate the other two color components for each of the pixels comprising a digital image, a process called CFA interpolation is performed. CFA interpolation refers to a type of algorithm that converts subsampled RGB pixel data into a fully-populated RGB color space by interpolating the missing color components for each pixel from the color component values of surrounding pixels.

88. As one of ordinary skill in the art would have understood at the time of the '121 patent application, it would be a routine design choice to select between using a three-CCD image sensor arrangement to generate a full set of RGB pixel data representing an image, or using a single CCD image sensor to generate a set of subsampled RGB pixel data representing an image, followed by CFA interpolation.

89. One of ordinary skill in the art, in reviewing the '121 patent disclosure, would have understood that, if a CFA approach was used, then CFA interpolation would commonly have been performed in the video input circuit of the disclosed still store system.

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Type 3B and 3C Digital cameras Image Processing chain

REDACTED

Type 3A digital cameras image processing chain

REDACTED

REDACTED

Type 2 digital cameras image processing chain

REDACTED

Altek Sunny 3/4 digital cameras image reproduction pipeline

REDACTED

REDACTED

Altek Sunny 6 Digital Cameras Image Processing Chain

REDACTED

Equivalents Of "Said Data"

REDACTED

REDACTED

REDACTED

4.5.1 Basic Structure of Primary Image Data

Image data employs following existing image formats, depending on the image data type:

- **RGB uncompressed data: Baseline TIFF Rev. 6.0 RGB Full Color Images,**
- **YCbCr uncompressed data: TIFF Rev. 6.0 Extensions YCbCr Images,**
- **JPEG compressed data: JPEG Baseline ADCT.**

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REDACTED

REDACTED

173. It is to be expected that the '121 patent does not mention that these various image processing techniques could be performed in between the initial storage of the image data in RAM and the subsequent storage on disk. As of the time of the '121 patent application, one of ordinary skill in the art, in reviewing the '121 patent disclosure, would have understood that these techniques would commonly have been performed in the video input circuit of the disclosed still store system. Given the state of the art as of 1983, the option of packaging the camera together with the image storage and retrieval components would not have been practical or worthy of mention.

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177. Indeed, I note that, in U.S. Patent No. 6,542,192 (Exhibit 18), which was assigned to Kodak, and which I understand is embodied in certain of the Kodak digital cameras, describes the data for the captured image, when stored in an Exif and DCF compliant image file on a storage device (such as a memory card), as "providing an accurate reproduction of the captured image."

178. I also note that U.S. Patent 5,016,107 (Exhibit 19), also assigned to Kodak, in referring to the JPEG compression techniques, states that, "This compression technique greatly reduces the number of bits required to represent a frame of still video information, without reduction in image quality, thereby greatly reducing the amount of storage that must be allocated ...." (Ex. 19, column 6, lines 47-51).

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Equivalence of Video Images and Video Pixel Data

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188. Indeed, as I explained above, the '121 patent preferred embodiment processes video images, including through analog to digital conversion and subsampling of chrominance information, and still characterizes those images as video images, and the data representing those images as video data.

189. Moreover, TV cameras in the 1982-83 timeframe performed substantial processing on video images, including automatic white balancing, edge

enhancement, color correction and others. Under what I understand to be Kodak's claim construction, the output of these TV cameras would be considered "video."

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192. The JPEG standard itself (excerpts of which are attached as Exhibit 20) states that the recommendations contained therein were based on the testing and compressions of video images.

193. In fact, as one of ordinary skill in the art would recognize, and as is disclosed in the '121 patent, lossy compression was performed on video images in the 1983 time frame.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 13 day of June, 2006, at Newark, Delaware.

Charles G. Boncelet, Jr.

Charles G. Boncelet, Jr.

CERTIFICATE OF SERVICE

I, the undersigned, hereby certify that on June 20, 2006, I caused to be electronically filed the foregoing with the Clerk of the Court using CM/ECF, which will send notification of such filing(s) to the following:

Collins J. Seitz, Jr., Esquire
Jaclyn Mason, Esquire
Connolly, Bove, Lodge & Hutz LLP

and that I caused copies to be served upon the following in the manner indicated:

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